

290578US0XPCT.ST25.txt
SEQUENCE LISTING

<110> Ishida, Nobuhiro
Tokuhiko, Kenro
Nagamori, Eiji
Takahashi, Haruo
Saito, Satoshi
Ohni Shi, Tohru

<120> Promoter in the presence of organic acid and utilization thereof

<130> 290578US0XPCT

<140> 10/578,614
<141> 2006-05-08

<150> PCT/JP04/16799
<151> 2004-11-05

<150> JP 2003-379076
<151> 2003-11-07

<160> 47

<170> PatentIn version 3.4

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| aaaaaaaaag tataaataga gacgatatat gccaatactt cacaatgttc gaatctattc | 840 |
| ttcatttgca gctattgtaa aataataaaa catcaagaac aaacaagctc aacttgtctt | 900 |
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| tgaagtgggt gcattgagcc gtattcttct tccccgtaag aaagttgtgt atccttttta | 180 |
| ctgcgttgta atagcttctg aaaacctaaa aaatgaacgc tatgtagctc atatccgttt | 240 |
| tgcataagta agaataacta cttgtgcagg gtgccgaaag ggatggaaaa ccgctgcagc | 300 |
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| ttttgttggc cttttccag atcctctaga atttttcaag ggtcgagccg taggaggatt | 420 |
| ctctcagaag gcaaaaacgc atcgaaagcg tgctttgtaa gaatatttg tatggctaaa | 480 |
| gtaagcaaag ccatatcccg atcccgatcc cgactcttat tccgatccct tccgccacat | 540 |
| cctgcatgtt tttcgaata ccaaattagc tcactctcgt ttttcatca tccctttctg | 600 |
| ctatggcaag gacaagtttt tttctagcat ctcatcgaac actttcctct ccctaattgg | 660 |
| ccaaagtttt catattcatc atcagttaga aagtataata tcaatccctt acctcattac | 720 |
| aagttgtatc aactaaaaa aatcatatat aagtctgtga gagtcttcaa ttatttagcg | 780 |
| taacacctat tcactttcta atcttgtttc ttgtttttac attctgcaat acaacacaac | 840 |
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| gatctcgccc ttttggccag acatctgata tgagcgtgag tgtgagtgac ttacacttg | 180 |
| tctatccacg tcctgaagtt gttcgtgttc tttggatatt cgtgttcaag ctaataatga | 240 |

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| aaaaaccggt cctgacgtca ctgaaaagat ttcggcacat ggtcatggga ccagagaaaa | 420 |
| attaatccga catgtggaat atttccttcc gttaaggtag tgagcgcgga ttttttctga | 480 |
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| caataaaaaa aagagatact tgtcaccatc tcgtctccct ttaccttttt tacttaatct | 180 |
| tcttcgctgt catctgttcc atccctttcc tagcttagtc ttctccggct agttcttagt | 240 |
| gcggtaagca aaaaaatagc gttttttttc cctcaccagg actttttttg ttaaccgaaa | 300 |
| atcggcatct ctagttttcc tggacaaaaa agacaaaatg gaaataaaca ctcatacgaa | 360 |
| tcagtaaaga tgtaataaat cgcagtaacg actgcacaag gatgtcagaa aaagcagttt | 420 |
| aattccagaa gtggttttcc aatttatcac acatgtacat gaagggaaat gtttaaatac | 480 |
| ggctttcgta aaacaaagga tctcttcacc tggtttcttc atttataagt agtgtctttt | 540 |
| tcggtaactt aagatatatc cttatttctt tcccacttct cgttatttct tctttttccc | 600 |
| ttttcaagtt cttcttttta tttattatta agcttatttt aattcttaga tcgttgtcac | 660 |
| tatcttttgt cttattgtt aagaaacatt gcgaagaaaa agaataataa aagaaactca | 720 |
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| acatccaatt ttttgaccct attttaacat taattttttg ctttaatttt aactaatacc | 840 |
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<213> Bos taurus

<220>

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<223> Lactate Dehydrogenase

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| 1 5 10 15 | |

| | |
|---|----|
| cat gtc ccc cag aat aag att aca att gtt ggg gtt ggt gct gtt ggc | 96 |
| His Val Pro Gln Asn Lys Ile Thr Ile Val Gly Val Gly Ala Val Gly | |
| 20 25 30 | |

| | |
|---|-----|
| atg gcc tgt gcc atc agt atc tta atg aag gac ttg gca gat gaa gtt | 144 |
| Met Ala Cys Ala Ile Ser Ile Leu Met Lys Asp Leu Ala Asp Glu Val | |
| 35 40 45 | |

| | |
|---|-----|
| gct ctt gtt gat gtc atg gaa gat aaa ctg aag gga gag atg atg gat | 192 |
| Ala Leu Val Asp Val Met Glu Asp Lys Leu Lys Gly Glu Met Met Asp | |
| 50 55 60 | |

| | |
|---|-----|
| ctc caa cat ggc agc ctt ttc ctt aga aca cca aaa att gtc tct ggc | 240 |
| Leu Gln His Gly Ser Leu Phe Leu Arg Thr Pro Lys Ile Val Ser Gly | |
| 65 70 75 80 | |

| | |
|---|-----|
| aaa gac tat aat gtg aca gca aac tcc agg ctg gtt att atc aca gct | 288 |
| Lys Asp Tyr Asn Val Thr Ala Asn Ser Arg Leu Val Ile Ile Thr Ala | |
| 85 90 95 | |

| | |
|---|-----|
| ggg gca cgt cag caa gag gga gag agc cgt ctg aat ttg gtc cag cgt | 336 |
| Gly Ala Arg Gln Gln Glu Gly Glu Ser Arg Leu Asn Leu Val Gln Arg | |
| 100 105 110 | |

| | |
|---|-----|
| aac gtg aac atc ttt aaa ttc atc att cct aat att gta aaa tac agc | 384 |
| Asn Val Asn Ile Phe Lys Phe Ile Ile Pro Asn Ile Val Lys Tyr Ser | |
| 115 120 125 | |

| | |
|---|-----|
| cca aat tgc aag ttg ctt gtt gtt tcc aat cca gtc gat att ttg acc | 432 |
| Pro Asn Cys Lys Leu Leu Val Val Ser Asn Pro Val Asp Ile Leu Thr | |
| 130 135 140 | |

| | |
|---|-----|
| tat gtg gct tgg aag ata agt ggc ttt ccc aaa aac cgt gtt att gga | 480 |
| Tyr Val Ala Trp Lys Ile Ser Gly Phe Pro Lys Asn Arg Val Ile Gly | |
| 145 150 155 160 | |

| | |
|---|-----|
| agt ggt tgc aat ctg gat tca gct cgc ttc cgt tat ctc atg ggg gag | 528 |
| Ser Gly Cys Asn Leu Asp Ser Ala Arg Phe Arg Tyr Leu Met Gly Glu | |
| 165 170 175 | |

| | |
|---|-----|
| agg ctg gga gtt cac cca tta agc tgc cat ggg tgg atc ctt ggg gag | 576 |
| Arg Leu Gly Val His Pro Leu Ser Cys His Gly Trp Ile Leu Gly Glu | |
| 180 185 190 | |

| | |
|---|-----|
| cat ggt gac tct agt gtg cct gta tgg agt gga gtg aat gtt gct ggt | 624 |
| His Gly Asp Ser Ser Val Pro Val Trp Ser Gly Val Asn Val Ala Gly | |
| 195 200 205 | |

| | |
|---|-----|
| gtc tcc ctg aag aat tta cac cct gaa tta ggc act gat gca gat aag | 672 |
|---|-----|

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| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Val | Ser | Leu | Lys | Asn | Leu | His | Pro | Glu | Leu | Gly | Thr | Asp | Ala | Asp | Lys | | |
| 210 | | | | | | 215 | | | | | 220 | | | | | | |
| gaa | cag | tgg | aaa | gcg | gtt | cac | aaa | caa | gtg | gtt | gac | agt | gct | tat | gag | 720 | |
| Glu | Gln | Trp | Lys | Ala | Val | His | Lys | Gln | Val | Val | Asp | Ser | Ala | Tyr | Glu | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gtg | atc | aaa | ctg | aaa | ggc | tac | aca | tcc | tgg | gcc | att | gga | ctg | tca | gtg | 768 | |
| Val | Ile | Lys | Leu | Lys | Gly | Tyr | Thr | Ser | Trp | Ala | Ile | Gly | Leu | Ser | Val | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| gcc | gat | ttg | gca | gaa | agt | ata | atg | aag | aat | ctt | agg | cgg | gtg | cat | ccg | 816 | |
| Ala | Asp | Leu | Ala | Glu | Ser | Ile | Met | Lys | Asn | Leu | Arg | Arg | Val | His | Pro | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | |
| att | tcc | acc | atg | att | aag | ggc | ctc | tat | gga | ata | aaa | gag | gat | gtc | ttc | 864 | |
| Ile | Ser | Thr | Met | Ile | Lys | Gly | Leu | Tyr | Gly | Ile | Lys | Glu | Asp | Val | Phe | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| ctt | agt | gtt | cct | tgc | atc | ttg | gga | cag | aat | gga | atc | tca | gac | gtt | gtg | 912 | |
| Leu | Ser | Val | Pro | Cys | Ile | Leu | Gly | Gln | Asn | Gly | Ile | Ser | Asp | Val | Val | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| aaa | gtg | act | ctg | act | cat | gaa | gaa | gag | gcc | tgt | ttg | aag | aag | agt | gca | 960 | |
| Lys | Val | Thr | Leu | Thr | His | Glu | Glu | Glu | Ala | Cys | Leu | Lys | Lys | Ser | Ala | | |
| 305 | | | | | 310 | | | | 315 | | | | | | 320 | | |
| gat | aca | ctt | tgg | ggg | atc | cag | aaa | gaa | ctg | cag | ttt | taa | | | | 999 | |
| Asp | Thr | Leu | Trp | Gly | Ile | Gln | Lys | Glu | Leu | Gln | Phe | | | | | | |
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<210> 8
 <211> 332
 <212> PRT
 <213> Bos taurus

<400> 8

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| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| His | Val | Pro | Gln | Asn | Lys | Ile | Thr | Ile | Val | Gly | Val | Gly | Ala | Val | Gly |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Met | Ala | Cys | Ala | Ile | Ser | Ile | Leu | Met | Lys | Asp | Leu | Ala | Asp | Glu | Val |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ala | Leu | Val | Asp | Val | Met | Glu | Asp | Lys | Leu | Lys | Gly | Glu | Met | Met | Asp |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Leu | Gln | His | Gly | Ser | Leu | Phe | Leu | Arg | Thr | Pro | Lys | Ile | Val | Ser | Gly |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Lys | Asp | Tyr | Asn | Val | Thr | Ala | Asn | Ser | Arg | Leu | Val | Ile | Ile | Thr | Ala |
| | | | 85 | | | | | | 90 | | | | | 95 | |

Gly Ala Arg Gln Gln Glu Gly Glu Ser Arg Leu Asn Leu Val Gln Arg
 100 105 110
 Asn Val Asn Ile Phe Lys Phe Ile Ile Pro Asn Ile Val Lys Tyr Ser
 115 120 125
 Pro Asn Cys Lys Leu Leu Val Val Ser Asn Pro Val Asp Ile Leu Thr
 130 135 140
 Tyr Val Ala Trp Lys Ile Ser Gly Phe Pro Lys Asn Arg Val Ile Gly
 145 150 155 160
 Ser Gly Cys Asn Leu Asp Ser Ala Arg Phe Arg Tyr Leu Met Gly Glu
 165 170 175
 Arg Leu Gly Val His Pro Leu Ser Cys His Gly Trp Ile Leu Gly Glu
 180 185 190
 His Gly Asp Ser Ser Val Pro Val Trp Ser Gly Val Asn Val Ala Gly
 195 200 205
 Val Ser Leu Lys Asn Leu His Pro Glu Leu Gly Thr Asp Ala Asp Lys
 210 215 220
 Glu Gln Trp Lys Ala Val His Lys Gln Val Val Asp Ser Ala Tyr Glu
 225 230 235 240
 Val Ile Lys Leu Lys Gly Tyr Thr Ser Trp Ala Ile Gly Leu Ser Val
 245 250 255
 Ala Asp Leu Ala Glu Ser Ile Met Lys Asn Leu Arg Arg Val His Pro
 260 265 270
 Ile Ser Thr Met Ile Lys Gly Leu Tyr Gly Ile Lys Glu Asp Val Phe
 275 280 285
 Leu Ser Val Pro Cys Ile Leu Gly Gln Asn Gly Ile Ser Asp Val Val
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 305 310 315 320
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<213> *Saccharomyces cerevisiae*

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 attcaacggc ttccttaact tctg 24

<210> 24
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic primer

<400> 24
 gttttcaagg aattagacac tgc 23

<210> 25
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
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<400> 25
 caacagtcctt ttgagtagca gtc 23

<210> 26
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 <212> DNA
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<220>
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 atatatgcgg ccgctcgag ccacgggtca acccg 35

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<210> 28
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 tatatactag ttgttttgt ttgtttgtgt gatgaatt 38

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 atatatgcgg ccgccctgct aaacacgccc tac 33

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 <212> DNA
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<220>
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 atatatacta gtttttgatt aaaattaaaa aaactttttg 40

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 <212> DNA
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<400> 32
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<210> 33

<211> 36
 <212> DNA
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<220>
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<400> 33
 atatatacta gttgaaattt gttgttttta gtaatc

36

<210> 34
 <211> 35
 <212> DNA
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<220>
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<400> 34
 atatatgcgg ccgcatccga attcaatgta gcacc

35

<210> 35
 <211> 37
 <212> DNA
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<220>
 <223> Synthetic primer

<400> 35
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37

<210> 36
 <211> 47
 <212> DNA
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<220>
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<400> 36
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47

<210> 37
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 <212> DNA
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<220>
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47

<210> 38
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
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<400> 38
 agctagctag cggccgcggtt gaatgttagc gtcaacaaca ag 42

<210> 39
 <211> 47
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic primer

<400> 39
 agctagctac tagtttgttt gtttatgtgt gtttattcga aactaag 47

<210> 40
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic primer

<400> 40
 agctagctag cggccgcggtt gaatgttagc gtcaacaaca ag 42

<210> 41
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic primer

<400> 41
 tatatactag ttgattgat ttgactgtgt tatttttg 37

<210> 42
 <211> 1052
 <212> DNA
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<220>
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<220>
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 <222> (13)..(1011)

<400> 42
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 Met Ala Thr Leu Lys Asp Gln Leu Ile Gln Asn Leu Leu
 1 5 10

aaa gaa gaa cat gtt cca caa aat aaa att act att gtt ggt gtt ggt 99

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| Lys | Glu | Glu | His | Val | Pro | Gln | Asn | Lys | Ile | Thr | Ile | Val | Gly | Val | Gly | |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----|
| 15 | | | | | | 20 | | | | | 25 | | | | | |
| gct Ala 30 | gtt Val | ggg Gly | atg Met | gct Ala | tgt Cys 35 | gct Ala | att Ile | tct Ser | att Ile | ttg Leu 40 | atg Met | aaa Lys | gat Asp | ttg Leu | gct Ala 45 | 147 |
| gat Asp | gaa Glu | gtt Val | gct Ala | ttg Leu 50 | gtt Val | gat Asp | gtt Val | atg Met | gaa Glu 55 | gat Asp | aaa Lys | ttg Leu | aaa Lys | ggg Gly 60 | gaa Glu | 195 |
| atg Met | atg Met | gat Asp | ttg Leu 65 | caa Gln | cat His | ggg Gly | tct Ser | ttg Leu 70 | ttt Phe | ttg Leu | aga Arg | act Thr | cca Pro 75 | aaa Lys | att Ile | 243 |
| gtt Val | tct Ser | ggg Gly 80 | aaa Lys | gat Asp | tat Tyr | aat Asn | gtt Val 85 | act Thr | gct Ala | aat Asn | tct Ser | aga Arg 90 | ttg Leu | gtt Val | att Ile | 291 |
| att Ile | act Thr 95 | gct Ala | ggg Gly | gct Ala | aga Arg | caa Gln 100 | caa Gln | gaa Glu | ggg Gly | gaa Glu | tct Ser 105 | aga Arg | ttg Leu | aat Asn | ttg Leu | 339 |
| gtt Val 110 | caa Gln | aga Arg | aat Asn | gtt Val | aat Asn 115 | att Ile | ttt Phe | aaa Lys | ttt Phe | att Ile 120 | att Ile | cca Pro | aat Asn | att Ile | gtt Val 125 | 387 |
| aaa Lys | tat Tyr | tct Ser | cca Pro | aat Asn 130 | tgt Cys | aaa Lys | ttg Leu | ttg Leu | gtt Val 135 | gtt Val | tct Ser | aat Asn | cca Pro | gtt Val 140 | gat Asp | 435 |
| att Ile | ttg Leu | act Thr | tat Tyr 145 | gtt Val | gct Ala | tgg Trp | aaa Lys | att Ile 150 | tct Ser | ggg Gly | ttt Phe | cca Pro | aaa Lys 155 | aat Asn | aga Arg | 483 |
| gtt Val | att Ile | ggg Gly 160 | tct Ser | ggg Gly | tgt Cys | aat Asn | ttg Leu 165 | gat Asp | tct Ser | gct Ala | aga Arg | ttt Phe 170 | aga Arg | tat Tyr | ttg Leu | 531 |
| atg Met | ggg Gly 175 | gaa Glu | aga Arg | ttg Leu | ggg Gly | gtt Val 180 | cat His | cca Pro | ttg Leu | tct Ser | tgt Cys 185 | cat His | ggg Gly | tgg Trp | att Ile | 579 |
| ttg Leu 190 | ggg Gly | gaa Glu | cat His | ggg Gly | gat Asp 195 | tct Ser | tct Ser | gtt Val | cca Pro | gtt Val 200 | tgg Trp | tct Ser | ggg Gly | gtt Val | aat Asn 205 | 627 |
| gtt Val | gct Ala | ggg Gly | gtt Val | tct Ser 210 | ttg Leu | aaa Lys | aat Asn | ttg Leu | cat His 215 | cca Pro | gaa Glu | ttg Leu | ggg Gly | act Thr 220 | gat Asp | 675 |
| gct Ala | gat Asp | aaa Lys | gaa Glu 225 | caa Gln | tgg Trp | aaa Lys | gct Ala | gtt Val 230 | cat His | aaa Lys | caa Gln | gtt Val | gtt Val 235 | gat Asp | tct Ser | 723 |
| gct Ala | tat Tyr | gaa Glu 240 | gtt Val | att Ile | aaa Lys | ttg Leu | aaa Lys 245 | ggg Gly | tat Tyr | act Thr | tct Ser | tgg Trp 250 | gct Ala | att Ile | ggg Gly | 771 |
| ttg Leu | tct Ser 255 | gtt Val | gct Ala | gat Asp | ttg Leu | gct Ala 260 | gaa Glu | tct Ser | att Ile | atg Met | aaa Lys 265 | aat Asn | ttg Leu | aga Arg | aga Arg | 819 |

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ggt cat cca att tct act atg att aaa ggt ttg tat ggt att aaa gaa 867
Val His Pro Ile Ser Thr Met Ile Lys Gly Leu Tyr Gly Ile Lys Glu
270 275 280 285

gat gtt ttt ttg tct gtt cca tgt att ttg ggt caa aat ggt att tct 915
Asp Val Phe Leu Ser Val Pro Cys Ile Leu Gly Gln Asn Gly Ile Ser
290 295 300

gat gtt gtt aaa gtt act ttg act cat gaa gaa gaa gct tgt ttg aaa 963
Asp Val Val Lys Val Thr Leu Thr His Glu Glu Glu Ala Cys Leu Lys
305 310 315

aaa tct gct gat act ttg tgg ggt att caa aaa gaa ttg caa ttt taa 1011
Lys Ser Ala Asp Thr Leu Trp Gly Ile Gln Lys Glu Leu Gln Phe
320 325 330

taactcgagc ttggttgaac acgttgccaa ggcttaagtg a 1052

<210> 43
<211> 332
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 43

Met Ala Thr Leu Lys Asp Gln Leu Ile Gln Asn Leu Leu Lys Glu Glu
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His Val Pro Gln Asn Lys Ile Thr Ile Val Gly Val Gly Ala Val Gly
20 25 30

Met Ala Cys Ala Ile Ser Ile Leu Met Lys Asp Leu Ala Asp Glu Val
35 40 45

Ala Leu Val Asp Val Met Glu Asp Lys Leu Lys Gly Glu Met Met Asp
50 55 60

Leu Gln His Gly Ser Leu Phe Leu Arg Thr Pro Lys Ile Val Ser Gly
65 70 75 80

Lys Asp Tyr Asn Val Thr Ala Asn Ser Arg Leu Val Ile Ile Thr Ala
85 90 95

Gly Ala Arg Gln Gln Glu Gly Glu Ser Arg Leu Asn Leu Val Gln Arg
100 105 110

Asn Val Asn Ile Phe Lys Phe Ile Ile Pro Asn Ile Val Lys Tyr Ser
115 120 125

Pro Asn Cys Lys Leu Leu Val Val Ser Asn Pro Val Asp Ile Leu Thr
130 135 140

290578US0XPCT.ST25.txt

Tyr Val Ala Trp Lys Ile Ser Gly Phe Pro Lys Asn Arg Val Ile Gly
145 150 155 160

Ser Gly Cys Asn Leu Asp Ser Ala Arg Phe Arg Tyr Leu Met Gly Glu
165 170 175

Arg Leu Gly Val His Pro Leu Ser Cys His Gly Trp Ile Leu Gly Glu
180 185 190

His Gly Asp Ser Ser Val Pro Val Trp Ser Gly Val Asn Val Ala Gly
195 200 205

Val Ser Leu Lys Asn Leu His Pro Glu Leu Gly Thr Asp Ala Asp Lys
210 215 220

Glu Gln Trp Lys Ala Val His Lys Gln Val Val Asp Ser Ala Tyr Glu
225 230 235 240

Val Ile Lys Leu Lys Gly Tyr Thr Ser Trp Ala Ile Gly Leu Ser Val
245 250 255

Ala Asp Leu Ala Glu Ser Ile Met Lys Asn Leu Arg Arg Val His Pro
260 265 270

Ile Ser Thr Met Ile Lys Gly Leu Tyr Gly Ile Lys Glu Asp Val Phe
275 280 285

Leu Ser Val Pro Cys Ile Leu Gly Gln Asn Gly Ile Ser Asp Val Val
290 295 300

Lys Val Thr Leu Thr His Glu Glu Glu Ala Cys Leu Lys Lys Ser Ala
305 310 315 320

Asp Thr Leu Trp Gly Ile Gln Lys Glu Leu Gln Phe
325 330

<210> 44
<211> 31
<212> DNA
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<220>
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<400> 44
atatatggat ccgcgtttat ttacctatct c

31

<210> 45

<211> 31
<212> DNA
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<220>
<223> Synthetic primer

<400> 45
atatatgaat tctttgattg atttgactgt g

31

<210> 46
<211> 34
<212> DNA
<213> Artificial Sequence

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<400> 46
atatatctcg aggccagcta acttcttggt cgac

34

<210> 47
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<400> 47
atatatgaat tctttgattg atttgactgt g

31